

1970

OPERATING SUMMARY

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SIDNEY TOWNSHIP

(Batawa)

water pollution control plant

ONTARIO WATER RESOURCES COMMISSION

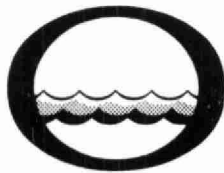
Division of Plant Operations

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Water management in Ontario

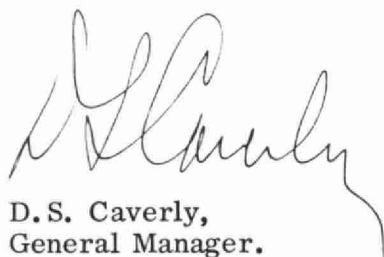
Ontario
Water Resources
Commission

135 St. Clair Ave. W.
Toronto 195
Ontario

Once again we have the privilege of submitting to you our latest detailed report on financial progress and technical activity at your water pollution control plant.

The statistical information contained in this annual operating summary will undoubtedly be a useful barometer of efficiency. Of particular interest will be the comments and recommendations of the regional operations engineer, who was intimately connected with day-to-day operation throughout 1970.

Together with the extensive cost data provided, this information should assist greatly in your general understanding of the problems met and dealt with, and in furnishing a yardstick for possible future expansion.



D. S. Caverly,
General Manager.



D. A. McTavish, P. Eng.,
Director,
Division of Plant Operations.

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water pollution control plant

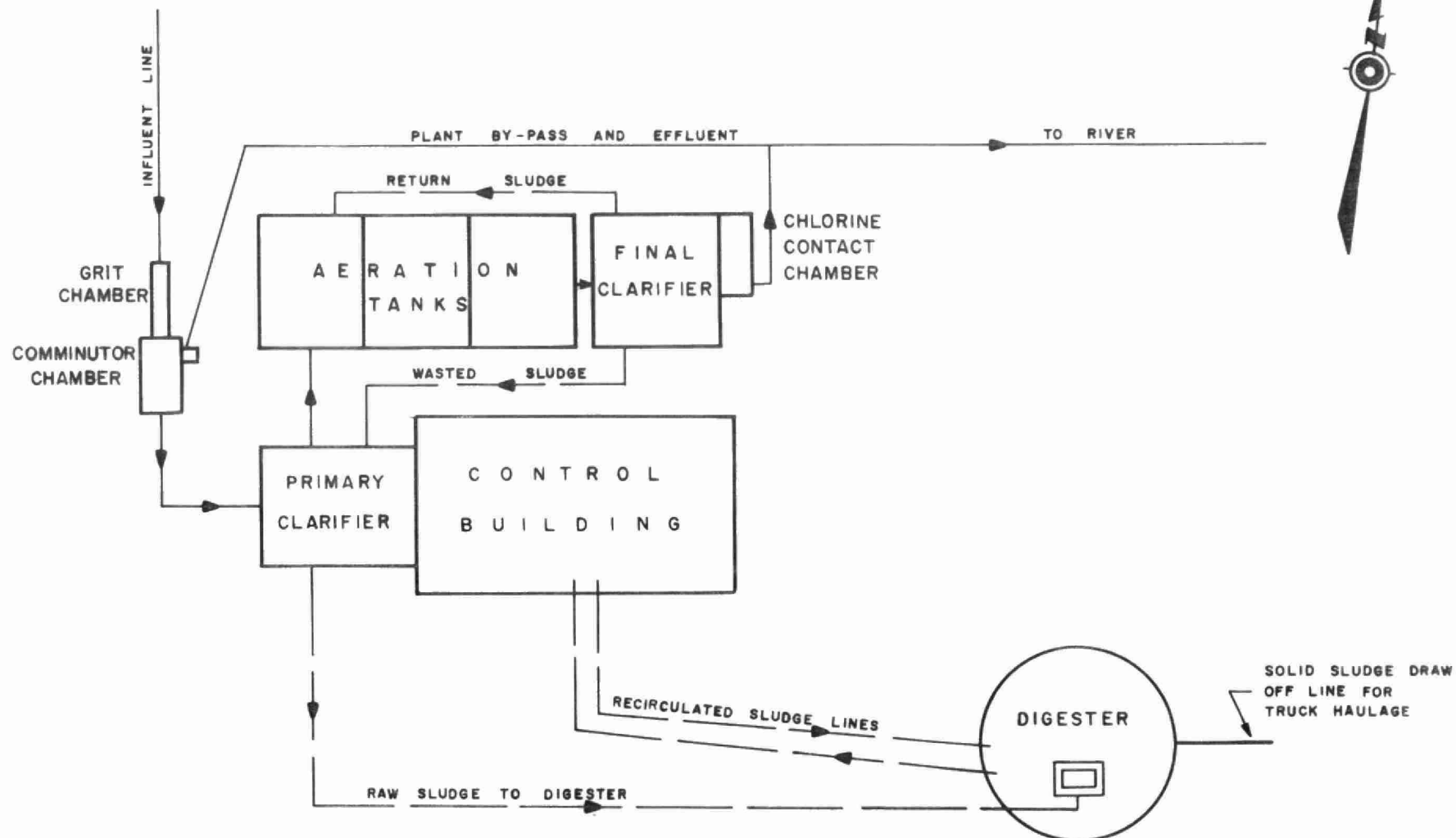
operated for

THE TOWNSHIP OF SIDNEY (BATAWA)

by the

ONTARIO WATER RESOURCES COMMISSION

1970 ANNUAL OPERATING SUMMARY



SIDNEY - BATAWA W P C P
FLOW CHART

DESIGN DATA

PROJECT NO.	2-0121-62	TREATMENT	Activated Sludge
DESIGN FLOW	0.12 mgd	DESIGN POPULATION	1,500
BOD - Raw Sewage	220 mg/l	SS - Raw Sewage	250 mg/l
- Removal	90%	- Removal	90%

PRIMARY TREATMENT

Grit Removal

Type: Channels, manually cleaned
 Size: Two 9' 3" x 9" x 6" swd
 Flow Velocity: 0.6 fps
 Retention: 16.6 sec

Comminution

- One Chicago Pump, Model 10A

Screening

- One 1½" c-c on comminutor bypass
- One 1½" c-c on plant bypass

Primary Sedimentation

Size: One 16' x 16' x 11' swd (9,130 gal)
 Retention: 1.83 hr
 Loading: Surface, 468 gal/ft²/day
 Weir, 3750 gal/ft/day

SECONDARY TREATMENT

Type: Diffused air; three-pass
 Size: One 30' x 20' x 10' swd (37,400 gal)
 Retention: 7.5 hr

Diffusers: Ceramic Tubes

Spacing: 9 per pass (2 passes)
 12 per pass (1 pass)

Air Supply

Type: Sutorbilt
 Size: Two 140 scfm @ 6 psi

Secondary Sedimentation

Type: Falk
 Size: One 20' x 12' x 10' swd (15,000 gal)
 Retention: 3.0 hr
 Loading: Surface, 500 gal/ft²/day
 Weir, 5000 gal/ft/day

CHLORINATION

Type: Advance
 Size: 50 lb/day

Chlorine Contact Chamber

Size: One 10' x 4' x 8' (2,000 gal)
 Retention: 24 min

OUTFALL

- to Trent River

SLUDGE HANDLING

Type: Fixed cover, integral heat
 exchanger coils
 Size: One 20' dia x 17' 4" (6,000 cu ft or
 37,500 gal)
 Loading: 1.5 lb/cu ft/mo

'70 REVIEW

FLOWS	DAILY FLOW mil gal	OCCURRING IN THE MONTH OF	MONTHLY FLOW mil gal	OCCURRING IN THE MONTH OF
Average	0.30	—	9.0	—
High	0.50	June	10.5	March
Low	0.10	October	7.1	September

GENERAL

This project consists of a 0.125 mgd conventional activated sludge plant, employing single stage digestion, with a design capacity of 262 pounds of BOD per day. There are no pumping stations associated with this project.

A survey of the Batawa sewer system was conducted during the summer. It appears that large quantities of cooling water were being directed to the sewer system via a drainage ditch which was tied into the sanitary sewers. This cooling water has since been directed to a storm sewer but flows at the sewage plant have not decreased significantly. Efforts are being made to locate watermain leaks and other sources of infiltration into the sewer system.

The effluent pump was overhauled and new sleeves and bearings were installed. A small tool and implement storage shed was constructed by plant staff on the sewage treatment plant grounds.

EXPENDITURES

The total cost of operating the plant was \$9,799.86. A good preventative maintenance program and lower fuel and salary costs, however, kept operating costs well within the 1970 budget of \$10,500.

The cost of treating 1,000,000 gallons of sewage was \$91.00.

PLANT FLOWS and CHLORINATION

A total of 108 million gallons of sewage were treated representing an average daily flow of 0.30 million gallons, which exceeded the design capacity of the plant 100% of the time. As noted in a report dated July, 1969 from the Division of Sanitary Engineering, the high sewage flows were due to numerous leaks in the Batawa water distribution system; cross connections between the sanitary and storm sewers and the generally poor condition of old sewers in the Village of Batawa. Although some corrective action has been taken since this time, there are still outstanding deficiencies.

The effluent from the treatment plant is chlorinated on a year round basis. A total of 3770 pounds of chlorine was used at an average dosage of 3.5 mg/l to obtain a chlorine residual of 0.5 mg/l before the total flow was discharged to the Trent River.

PLANT EFFICIENCY

The average concentrations of BOD and suspended solids in the plant influent were 40 and 54 mg/l respectively.

The average concentrations of BOD and suspended solids in the plant effluent were 19 mg/l and 28 mg/l respectively. This represented a reduction in BOD and suspended solids of 54% and 57% respectively. The effluent concentrations were above the OWRC objectives.

These low efficiencies can be attributed to the very weak nature of the raw sewage combined with the severe hydraulic loading. The very low influent concentrations are indicative of large amounts of infiltration to the collection system.

SLUDGE DIGESTION and DISPOSAL

A total of 247,700 gallons of raw sludge with an average solids content of 2.3% was pumped to the digester. Approximately 16,130 gallons of digested sludge with an average solids content of 4.3% was disposed of by tank truck haulage.

CONCLUSIONS

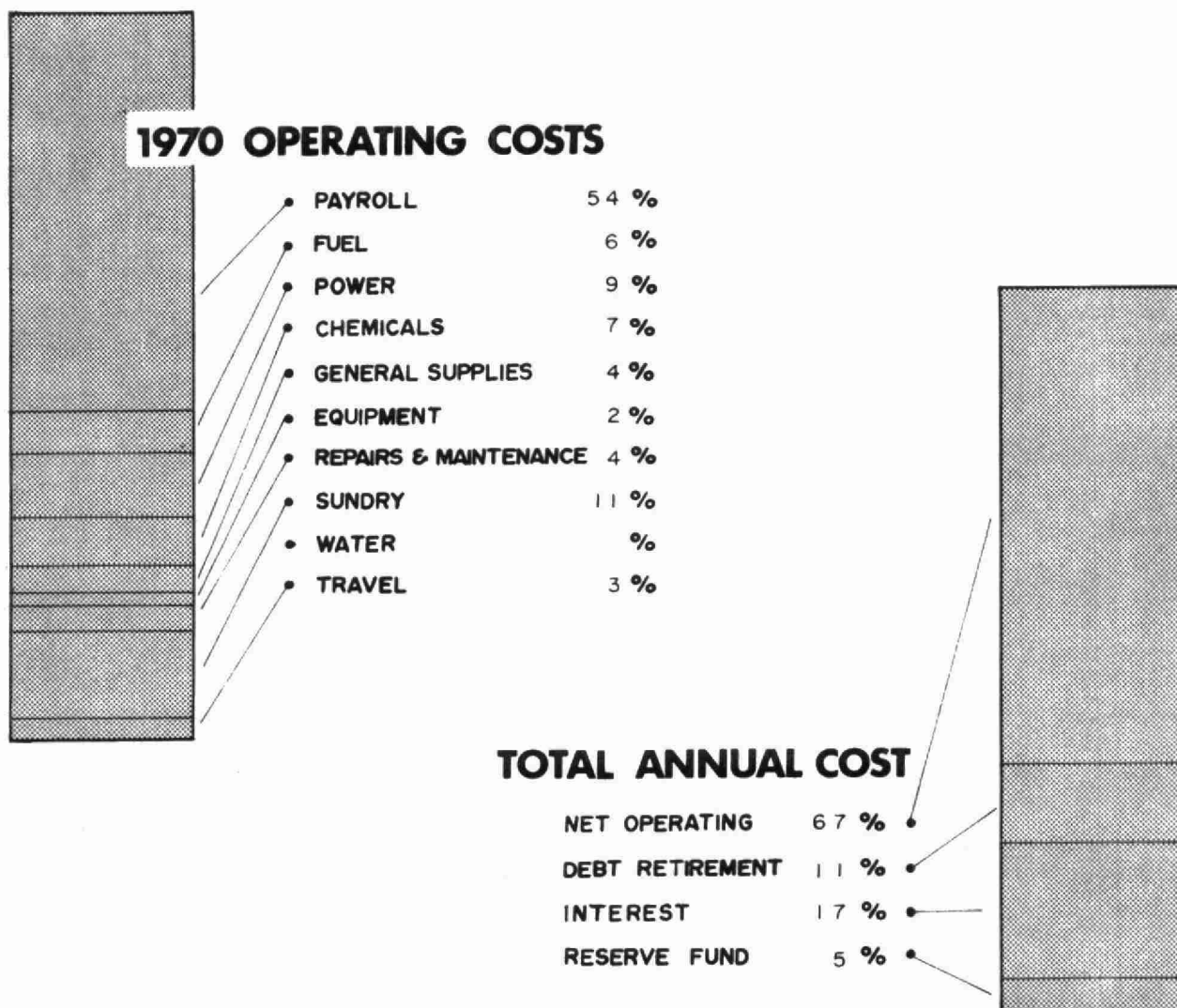
The Commission's objectives for effluent concentrations were not realized at this project due to high flows being received at the sewage treatment plant. A more concerted effort must be made to locate and reduce the amount of infiltration and ground water being received into the sanitary sewer system. If results are not forthcoming in 1971, then plans for the enlargement of the plant will be initiated.

PROJECT COSTS

NET CAPITAL COST (Final)	\$162,152.89
DEDUCT - Portion financed by CMHC/MDLB (Final)	<u>109,605.08</u>
Long Term Debt to OWRC	\$ <u>52,547.81</u>
Debt Retirement Balance at Credit (Sinking Fund) December 31, 1970	\$ <u>16,655.05</u>
Net Operating	\$ 11,362.21
Debt Retirement	1,906.00
Reserve	872.41
Interest Charged	<u>2,944.06</u>
TOTAL	\$ <u>17,084.68</u>

RESERVE ACCOUNT

Balance @ January 1, 1970	\$ 5,436.19
Deposited by Municipality	872.41
Interest Earned	<u>352.92</u>
	\$ 6,661.52
Less Expenditures	<u>1,187.55</u>
Balance @ December 31, 1970	\$ <u>5,473.97</u>



Yearly Operating Costs

YEAR	MILLION GALLONS TREATED	TOTAL OPERATING COSTS	COST PER MILLION GAL	COST PER LB OF BOD REMOVED
1966	87.42	\$6,812.13	\$101.04	15 cents
1967	78.97	7,313.53	92.61	13 cents
1968	89.97	7,563.26	84.06	16 cents
1969	118.72	9,314.82	78.46	31 cents
1970	108.2	9,799.86	90.60	39 cents

MONTHLY OPERATING COSTS

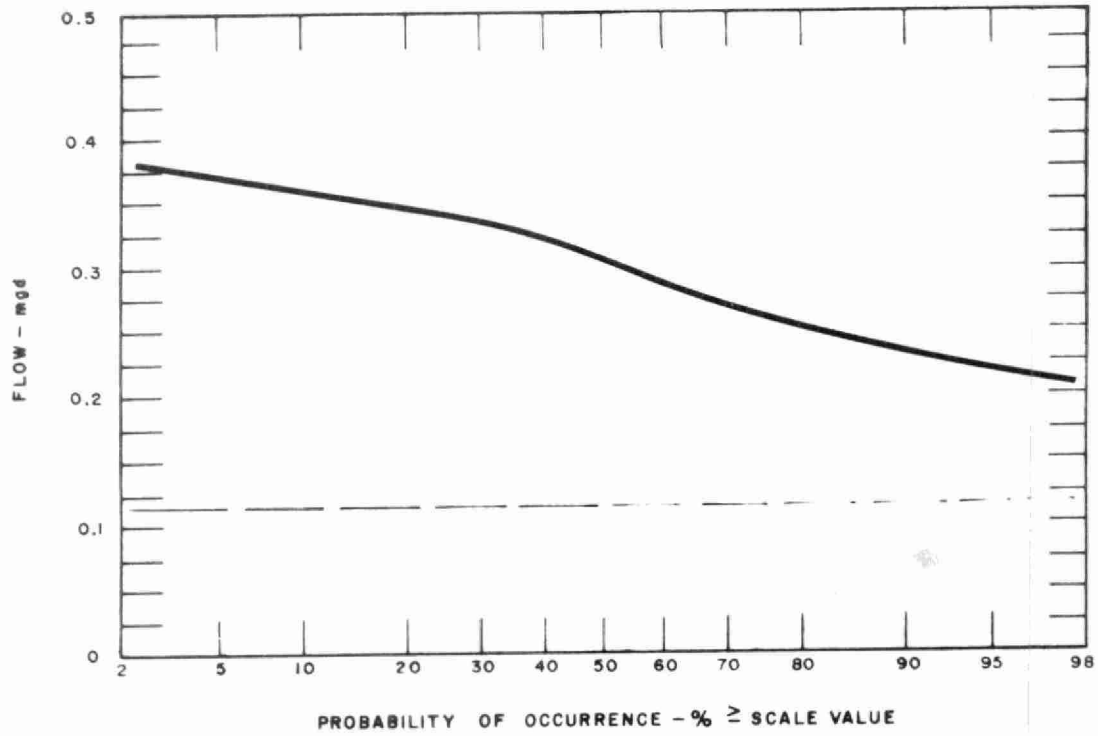
MONTH	TOTAL EXPENDITURE	PAYROLL	CASUAL PAYROLL	FUEL	POWER	CHEMICALS	GENERAL SUPPLIES	EQUIPMENT	REPAIRS and MAINTENANCE	SUNDRY *	WATER	TRAVEL
JAN	741.40	649.23	-	-	72.07	-	-	-	-	-	-	20.10
FEB	888.38	471.47	-	108.38	72.07	110.25	42.67	-	-	40.12	-	43.42
MAR	287.63	104.34	-	49.31	72.74	-	15.57	-	-	-	-	45.67
APR	314.77	53.19	-	75.27	66.67	-	24.50	40.95	-	15.94	-	38.25
MAY	1693.10	1344.15	-	62.95	79.49	145.30	-	-	-	11.71	-	49.50
JUNE	211.00	-	-	54.48	65.32	-	19.84	-	-	10.24	-	61.12
JULY	1233.47	650.10	-	71.57	68.02	-	60.49	-	80.00	279.22	-	24.07
AUG	647.53	122.76	-	-	76.12	145.30	-	-	257.25	46.10	-	-
SEPT	727.86	159.58	-	32.27	66.67	-	41.73	187.37	-	240.24	-	-
OCT	810.41	467.21	-	25.81	76.12	145.30	28.66	-	43.89	23.42	-	-
NOV	310.21	94.11	-	32.67	70.04	-	88.42	-	-	24.97	-	-
DEC	1934.10	1170.89	-	92.02	62.62	145.30	93.23	-	-	334.87	-	35.17
TOTAL	9799.86	5287.03	-	604.73	847.95	691.45	415.11	228.32	381.14	1026.83	-	317.30

BRACKETS INDICATE CREDIT

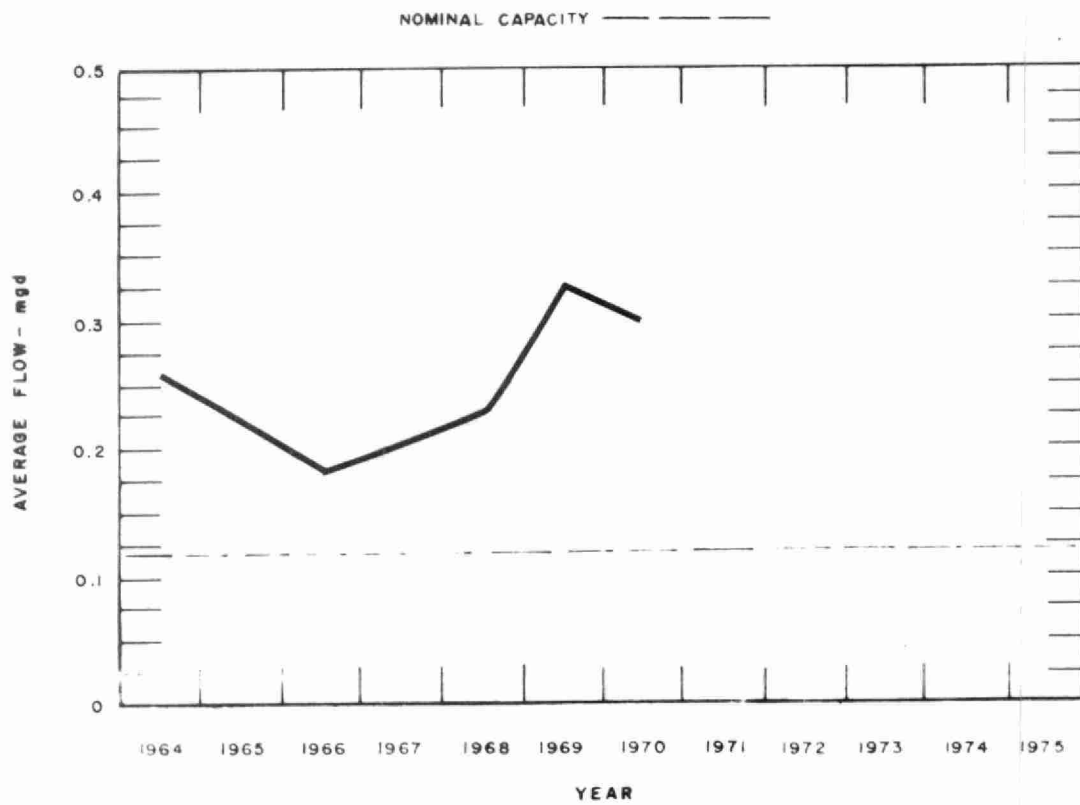
* SUNDRY INCLUDES SLUDGE HAULAGE COSTS WHICH WERE \$264.00

Note: Total does not include year end adjustments.

PROCESS DATA

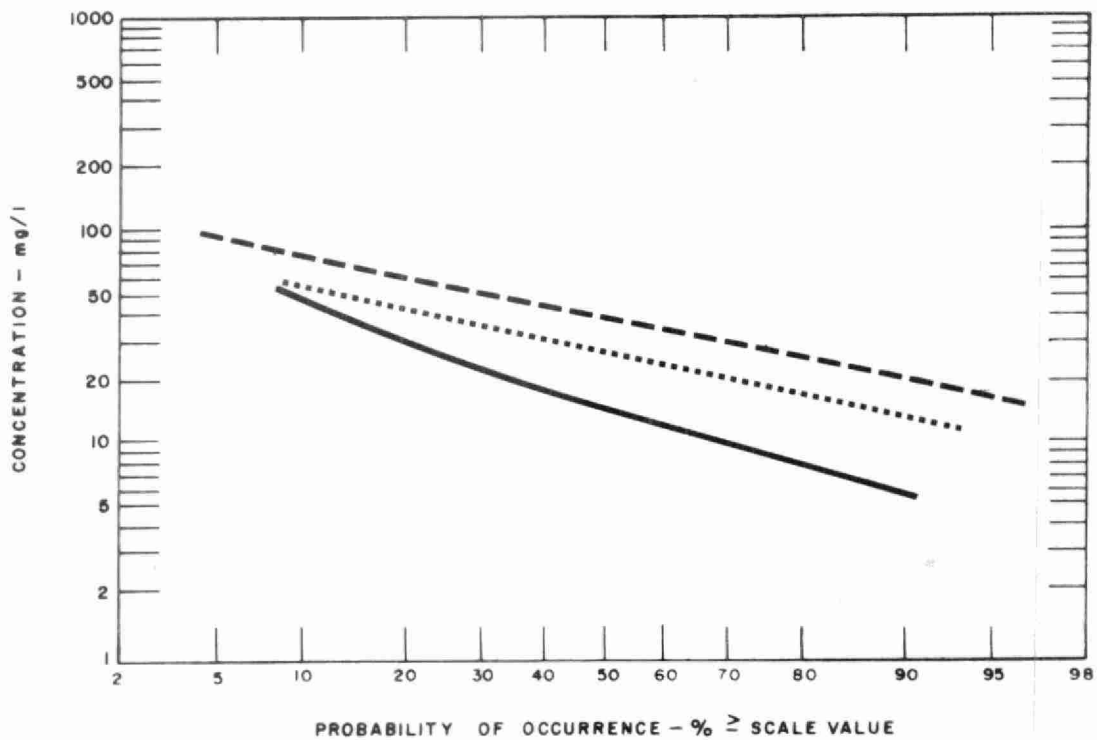


FLAWS

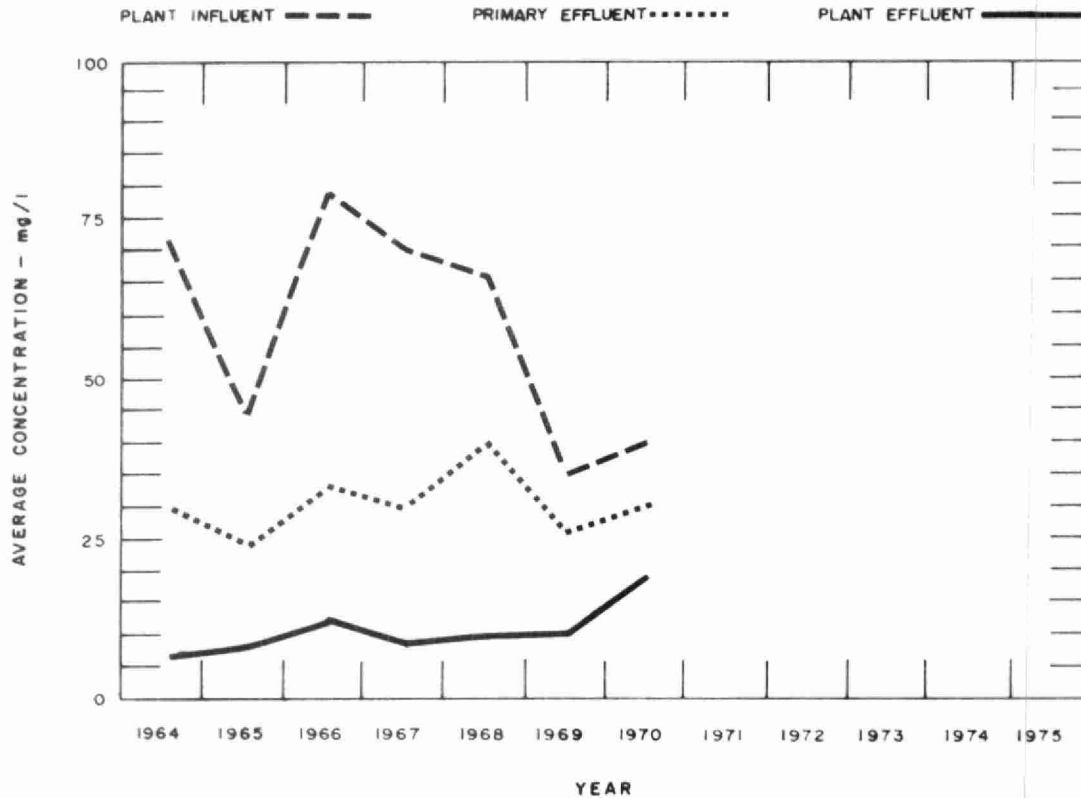


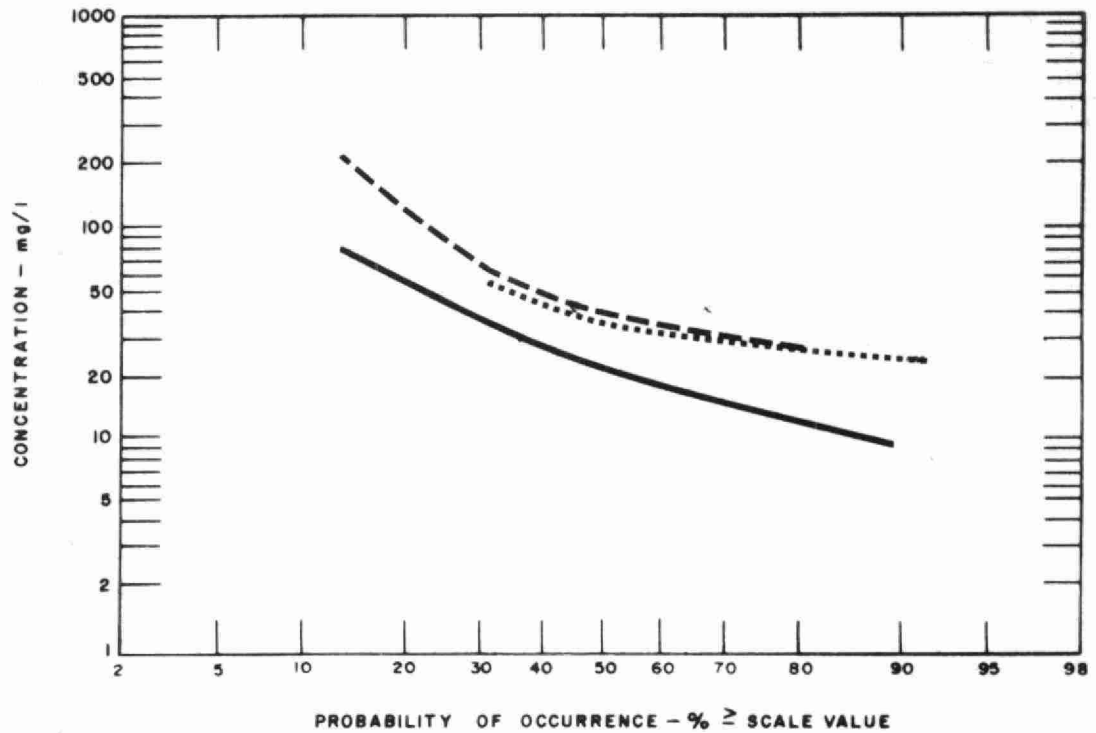
PLANT FLOWS and CHLORINATION

MONTH	TOTAL FLOW mil gal	AVERAGE DAILY FLOW mil gal	MAXIMUM DAILY FLOW mil gal	MINIMUM DAILY FLOW mil gal	CHLORINE USED pounds	DOSAGE mg/l
JAN	10.2	.33	.4	.3	360	3.5
FEB	9.6	.34	.4	.3	330	3.4
MAR	10.5	.34	.4	.2	300	2.9
APR	10.4	.35	.4	.3	250	2.4
MAY	9.2	.30	.4	.2	250	2.8
JUNE	7.5	.25	.5	.2	330	4.5
JULY	8.8	.28	.4	.2	350	3.9
AUG	7.8	.25	.3	.2	330	4.2
SEPT	7.1	.24	.3	.2	320	4.5
OCT	7.2	.23	.3	.1	310	4.3
NOV	10.0	.33	.4	.2	320	3.2
DEC	9.9	.32	.4	.2	320	3.3
TOTAL	108.2	-	-	-	3770	-
AVERAGE	-	.30	-	-	310	3.5

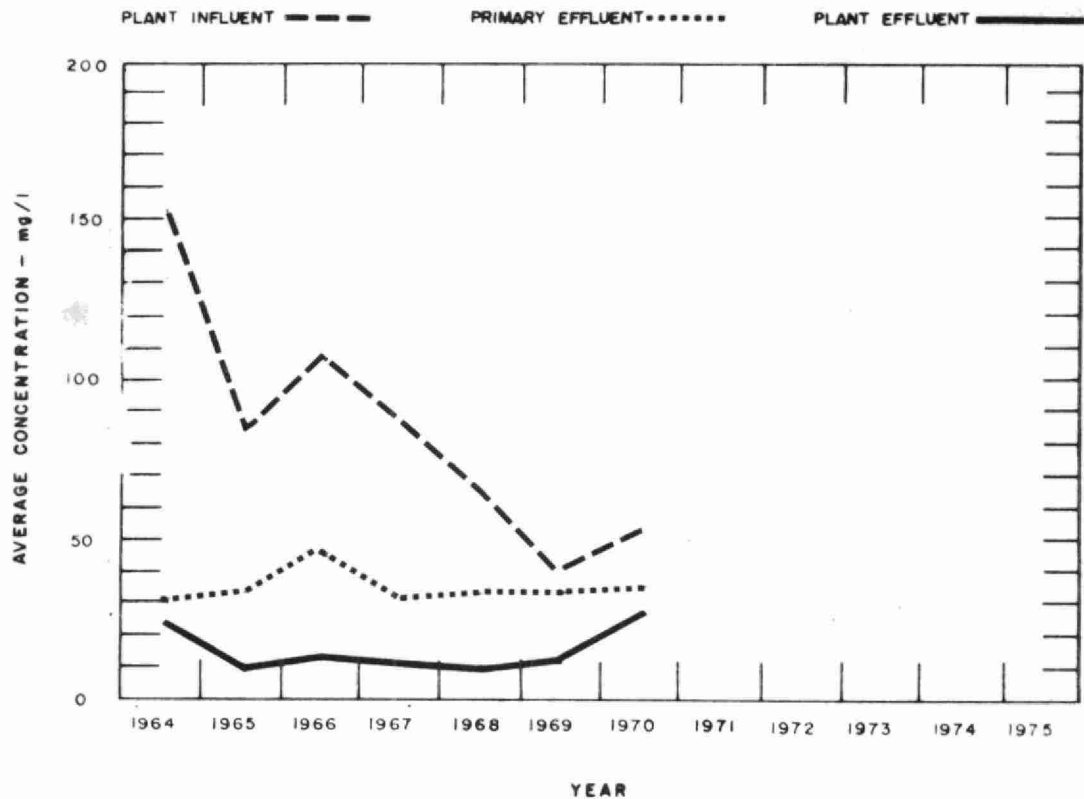


BIOCHEMICAL OXYGEN DEMAND





SUSPENDED SOLIDS



PLANT EFFICIENCY

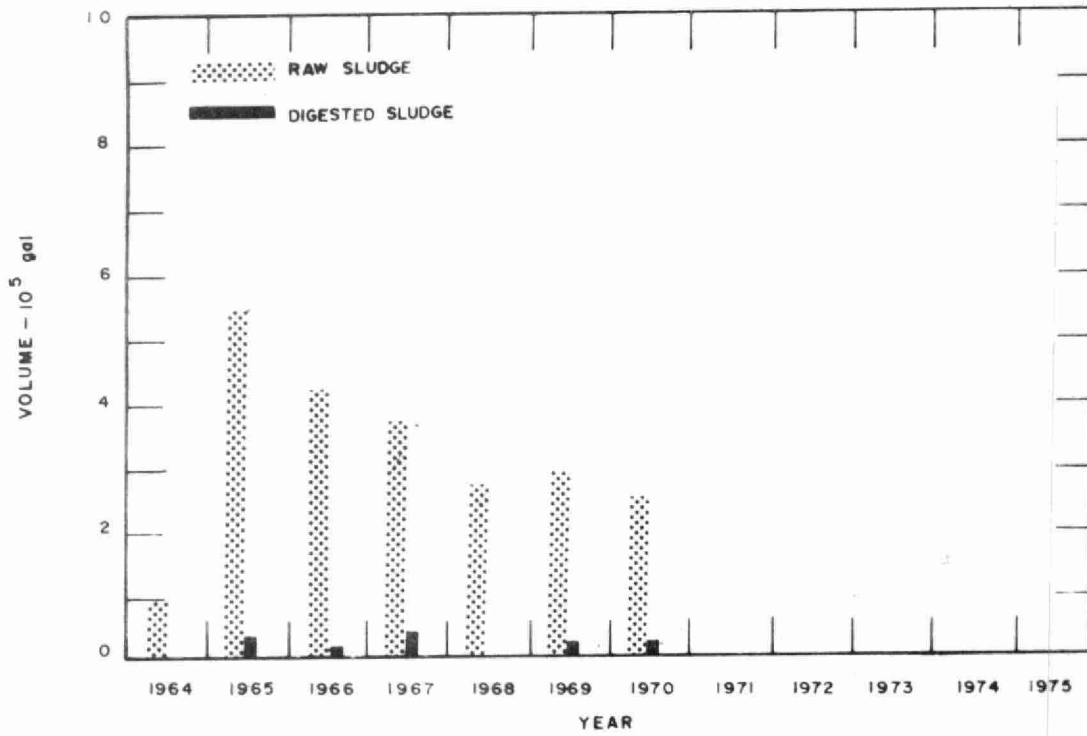
MONTH	BIOCHEMICAL OXYGEN DEMAND						SUSPENDED SOLIDS						GRIT REMOVED cu ft
	INFLUENT		EFFLUENT		REDUCTION		INFLUENT		EFFLUENT		REDUCTION		
	n	mg/l	n	mg/l	%	10 ³ pounds	n	mg/l	n	mg/l	%	10 ³ pounds	
JAN	1	30	1	10	67	2.0	1	30	1	10	67	2.0	
FEB	1	80	1	55	31	2.4	1	200	1	75	63	12.1	
MAR	0	-	0	-	-	-	0	-	0	-	-	-	
APR	1	44	1	15	66	3.0	1	40	1	20	50	2.1	
MAY	0	-	0	-	-	-	0	-	0	-	-	-	
JUNE	1	44	0	-	-	-	1	40	0	-	-	-	
JULY	2	24	0	-	-	-	2	38	0	-	-	-	
AUG	0	-	0	-	-	-	0	-	0	-	-	-	
SEPT	1	20	1	18	10	.2	1	30	1	30	0	0	
OCT	2	45	2	6	87	2.8	2	75	2	12	84	4.6	
NOV	2	32	2	12	62	2.0	2	28	2	22	21	.6	
DEC	1	40	0	-	-	-	1	25	-	-	-	-	
TOTAL	12	-	8	-	-	-	12	-	8	-	-	-	
AVERAGE	-	40	-	19	54	2.1	-	54	-	28	57	4.3	

NOTE - n is the number of samples taken

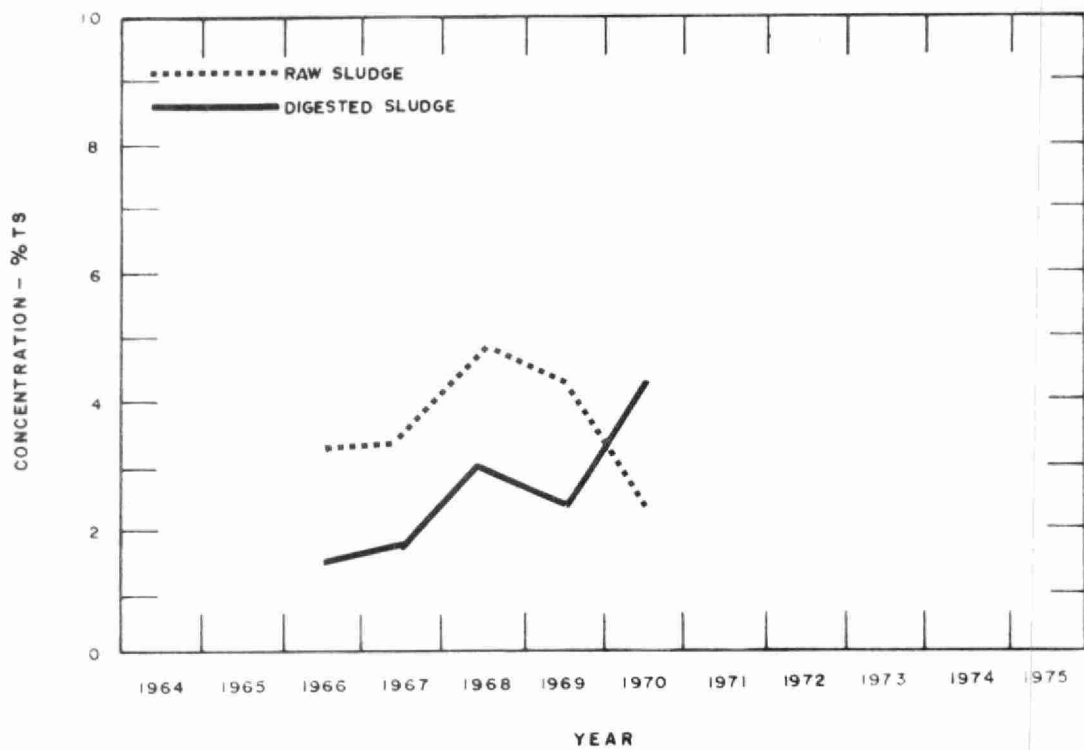
AERATION

MONTH	AVG DAILY FLOW mil gal	AERATION INF.		SECONDY. EFF.		MLSS CONCN mg/l	F/M lb BOD lb MLSS	AIR USED 1000 cu ft lb BOD	WASTE SLUDGE lb/DAY
		BOD	SS	BOD	SS				
		mg/l	mg/l	mg/l	mg/l				
JAN	.25	28	30	10	10	1940	.10	-	-
FEB	.25	20	20	55	75	2490	.05	-	-
MAR	.25	-	-	-	-	1090	-	-	-
APR	.25	30	30	15	20	100	2.0	-	-
MAY	.25	-	-	-	-	1050	-	-	-
JUNE	.24	44	70	8	5	1880	.15	-	-
JULY	.25	28	45	8	10	1800	.10	-	-
AUG	.20	-	-	-	-	2120	-	-	-
SEPT	.24	18	25	8	10	2430	.05	-	-
OCT	.24	40	35	5	6	2440	.11	-	-
NOV	.24	33	38	12	18	2360	.09	-	-
DEC	.25	26	15	6	15	2360	.07	-	-
TOTAL	-	-	-	-	-	-	-	-	-
AVERAGE	.24	30	34	14	19	1840	.09*	-	-

*Excludes April



DIGESTION



SLUDGE DIGESTION and DISPOSAL

MONTH	RAW SLUDGE			DIGESTED SLUDGE			SUPERNATANT		SLUDGE DISPOSAL	
	VOLUME	TOTAL SOLIDS	VOL SOLIDS	VOLUME	TOTAL SOLIDS	VOL SOLIDS	VOLUME	TOTAL SOLIDS	DEWATERED	LIQUID
	10 ³ gal	%	%	10 ³ gal	%	%	10 ³ gal	%	cu yd	cu yd
JAN	20	.4			5.6		20	.04		
FEB	19	3.6			4.7		19	-		
MAR	21	-			-		21	-		
APR	18	-			-		17	-		
MAY	20	2.8			2.6		20	.05		
JUNE	25	-			-		25	-		
JULY	26	-			-		26	-		
AUG	24	-			-		24	-		
SEPT	21	-			-		21	-		
OCT	16	-			-		16	-		
NOV	20	-		16	-		20	-	96	
DEC	19	-			-		19	-		
TOTAL	248	-			-		247	-		
AVERAGE	-	2.3		16	4.3		20.6	-	96	

Date Due

[illegible]



Water management in Ontario